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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON INTELLECTUAL PROPERTY

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I. ABSTRACT

The development of Artificial Intelligence (AI) has created a tremendous impact on today's world. From AI assisted tools to current trend of AI generated inventions, we are witnessing a fast pace in technological development. They provide ultimate benefits in everyday lives which is unavoidable while it also awakens various issues and debates among the people. This paper explores the profound impact of AI on Intellectual Property (IP) and focuses on the issues that arise as a result of this intersection. As AI technologies continue to advance rapidly, questions surrounding the protection, ownership and infringement of IP becomes increasingly complex. This paper thus aims to provide an in-depth examination of these issues, offering insights into the evolving landscape of IP in the age of AI.

II. KEYWORDS

Artificial Intelligence (AI), Intellectual Property (IP), Intellectual Property Rights, World Intellectual Property Organization (WIPO), Copyright, Patent.

III. INTRODUCTION:

AI has become one of the most innovative and revolutionary technology globally and has intervened in the elements of everyday life creating innovation and opportunities. What was considered as a fiction or an imagination has now become a reality that is providing various benefits including in industrial aspects. For example, when we consider AI in healthcare it has humongous use for diagnosis and drug discovery that include cancer detection and also for streamlining management of medical records and also helped in

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revolutionizing surgical procedures that operates with increase precision and reducing recovery times. AI's significance in healthcare sector is unavoidable. Its application in healthcare and its consequent benefits are immense that include wide range of services including data mining, highly accurate diagnosis and treatment of medical conditions, drug discovery, robotic surgery, etc.[2] When considering education field, its application is immense in this particular field and it has transformed the way we learn. It has introduced various applications including personalized learning based on individual student requirements, intelligent tutoring, virtual assistants capable of guiding students in every form and automated grading that help save time and enhances feedback support for students that ultimately enhance their learning experience. Its application in the manufacturing industry is also considered significant in nature that includes various functions like product designing, machine learning (ML) in maintenance and prediction of malfunctions if any. Also, nowadays its application is an integral part of production processes and also aids greatly in quality control.

Apart from benefitting these industries, AI provides for various applications and resultant benefits in various other industries as well that consists of finance, retail, transportation, entertainment, agriculture, cyber security, environmental monitoring, etc.

[2] Akash Takyar, *AI Use Cases & Applications Across Major industries*, (Aug. 2, 2019), https://www.leewayhertz.com/ai-use-cases-and-applications/.

Image 1 Source: Artificial Intelligence (Ai) & Intellectual Property, available at https://suranaandsurana.com/2022/03/15/artificial-intelligence-ai-intellectual- property/

It changed the way we approach the situations and has improved efficiency and productiveness. It has improved in a rapid and a brilliant pace and has sparked innovation in every area it touches.

Intellectual Property is the creation of an intellect. It is the result of expressions of human mind which involves originality and creativity. To invoke copyright protection under the law, it must be arisen out of human creation and must be original along with an appropriate amount of creativity.

Intellectual Property is a wide area of study that includes within its ambit copyright, patent, trademarks, trade secrets, etc. In each and every aspect of IP, there exists the concept of 'human creation' which may depict the legal regime to recognize works of human creations only. But it raises arguments on whether the IP regime focuses on only giving recognition to human created works or whether it gives protection to original works and aims to incentivize the author irrespective of the origin, i.e., whether it is human or not.

As far as current legislations are concerned, only human works are given legal protection under IP regime. On the other hand, AI is a non-human entity which raises issues on whether AI generated works can be granted protection or not.

This is not the first time in history that a non-human entity is considered for IP protection. Monkey Selfie case that arose in USA is one such case where the court in its final verdict held that monkey cannot be an author and thus rejected the notion of protection of works that are created by non-human entities. Thus from the judicial interpretations it is clear that non-person entity is not afforded any kind of protection and this can be attributed to the ambiguous interpretation of the term author.

IV. DIFFERENCE BETWEEN OTHER NON-PERSON ENTITIES AND AI:

As seen above it is clear that non-person entities like animals are not granted IP protection. But we cannot place both AI and other non-person entities on the same footing. Both are significantly different and unique from each other.

Animals, a non-person entity, is considered as a property of individual or a State. They cannot be regarded as authors. But on the other hand, AI is considered as an Intellectual Property. It is data dependent and can act according to the data fed to it. It can produce works that are worth copyrightable. Not to forget, it also corresponds to the human ability of producing original and creative works from the data collected and stored in the past. Hence, from all the above statements, we can clearly demarcate the fundamental and conspicuous distinctions between AI and other non-person entities. This leads us to the conclusion that we cannot and must not place AI and the other non-person entities on the same footing. Thus we cannot negate protection just because of its character as a non-person entity and we must afford protection to AI works as well. Here comes the heart of the issue which is who will be deemed the inventor or the author if such work is generated by AI. Let us look upon these issues in the following discussions.

V. NATURE OF AI IN IP WORKS:

Before we delve into the issues revolving around AI and its protection it is imperative to understand the nature of AI and its extent of participation in such works. This is significant due to the fact that extent of AI's role and its debatable rights are coextensive in nature, i.e., whether there exists any protection and whether there are any attributable rights to AI are to be answered and decided on the basis of its participation in the intellectual property related works.

Intellectual Property works that involve the participation of AI can be classified into two kinds of works for better understanding.

One of such classification is referred as *AI-assisted works* where AI is a mere tool. Here, the author is a human and he produces copyrightable or patentable work wherein AI is used only as a tool or means to produce such expression of his intellect. Human involvement is substantial in nature in this scenario and AI is just like any other tool used in any other works. For example, a photographer produces a copyrightable photograph using camera as a tool to produce such expression and here camera cannot be given any protection under IP law and there will not arise any issue related to the current debate.

Another classification is where the issue lies and here AI is not a mere tool and it comes in par with human as it generates original works that are worth copyrightable. These are referred as *AI generated works* and it generates work with very little human intervention. Human involvement is very little that it may not be regarded as substantial thus negating him as an author. Here, AI alone becomes eligible for authorship and also the consequent issues arise that need clear judicial interpretations and amendments in the near future.

Table comparing AI Assisted Works vs. AI Generated Works

	AI Assisted Works	AI Generated Works
Meaning	Works created with the assistance of AI tools or systems, where humans play a significant role in the creative process	Works entirely or predominantly y generated by AI systems, often with minimal to no human intervention in the creation process

Human Involvement	Humans are actively involved in the creative process, providing input, guidance, and oversight to AI tools or systems	Limited or no direct human involvement in the creative process; AI systems independently generate the works based on pre-programmed algorithms or training data
Ownership	Generally, copyright and intellectual property rights are attributed to the human creators who utilize AI tools or systems	Ownership and attribution of intellectual property rights is an issue and may vary depending on factors such as the level of human input, autonomy of the AI system, and contractual agreements
Legal Considerations	Copyright laws typically attribute ownership to human creators, with AI tools considered as tools used in the creative process	Legal frameworks may need to adapt to address the unique challenges of AI-generated works, including issues related to copyright ownership, attribution, and infringement
Ethical Implications	Concerns may arise regarding transparency, accountability, and potential biases in AI-assisted works	Ethical considerations may include questions about the authenticity, authorship, and societal impact of AI-generated works, as well as the responsible use of AI technologies in creative endeavours
Examples	Graphic design projects where AI tools assist in creating visual elements or layouts, writing assistance tools that suggest improvements or generate text based on user input	AI-generated artwork, music, or literature where AI systems create original works without direct human intervention like RAGHAV AI, NEXT REMBRANDT

Let us see the where the issue lies in AI generated works and discuss about the solutions that are already in practice for better insight into the need for a change in the future.

VI. MAJOR ISSUES IN AI GENERATED WORKS:

AI generated works are original works produced on data fed into it and thus are suitable for providing copyrights or patents or any other IP protection. Questions arise as to major issues related to authorship, inventorship, ownership, moral rights and so on. Can AI be granted authorship? Is it qualified for such kind of protection? Can it be deemed and

named as author in the copyright/patent application? Do the laws intend to include AI under the definition of author when it is the case of AI generated works? These issues are to be answered, which is the urgent need of the hour so as to prevent future chaos that would result to due to the rapid development of AI and other similar technologies.

AI generated works challenges the fundamental notion of authorship and poses key issues such as who holds the copyright, whether the AI itself or the programmer or the user who commissioned the work. These issues test the traditional understanding of creativity and originality that are considered heart of copyright law and also invokes the assessment of whether AI creations meet the originality and creativity standards set by the copyright law. Striking a balance between fostering innovation and protecting intellectual property rights in AI era is thus crucial[3]. All these considerations evolve around the intellectual and creative activities of 'human inventors' and, thus, leave little space for 'non-human inventors'[4].

VII. NEED FOR LEGAL PERSONALITY OF AI TO HOLD IP RIGHTS:

Legal Personality is an important aspect that are to be considered while providing for IP rights and its necessity is thus concerned with as a pre-condition for holding IP rights. IP is the creation of intellect and protection is given to the expression and skill and creativity by the author and that is the essence of such protection. From what is abovementioned, we can clearly understand the need for the presence of legal personality to hold the right. AI's status on legal personality is a global issue whose notions vary from a country's legal system to another. This calls for the necessity of a proper legal framework globally to recognize AI as a legal personality and accord it with the said rights and thus provide it with its far needed recognition for its works. Various theorists provide different viewpoints when it comes to provision of legal personality to AI that vary from providing authorship to person behind such creation of the AI program itself to providing

[3] Muhammad Hamza Zakir et al., *The Impact of Artificial Intelligence on Intellectual Property Rights*, 3 International Journal of Human Society(IJHS) (2023)
[4] Dr Hayleigh Bosher, *WIPO Impact of Artificial Intelligence on IP Policy Response From Brunel University London, Law School & Centre for Artificial Intelligence*,

authorship to AI as a standalone author without any accord to humans. With its immense benefits in various industries and its future use, we can agree with its capacity to affect the rights and obligations of others in the future. This supports the argument for necessity for legal personality of AI for its better recognition especially in the IP regime. Like other non-human entities like firms having legal personality, AI must also be accorded with the same and it is subjected to a limited legal personality. If facilitated it would provide for greater benefits to mankind and may aid for the enhancement of efficiency of every work done by the mankind.

What is the status of Strong AI is yet another crucial aspect that may pose issues in the future and thus invokes a revision in the policy.

VIII. SHOULD THE LAW EXCLUDE FROM AVAILABILITY OF PATENT PROTECTION ANY INVENTION THAT HAS BEEN GENERATED AUTONOMOUSLY BY AN AI APPLICATION?

Most of the theorists lay basis that the primary justification of patent law is utilitarian in nature thus aimed at rewarding human inventors. These protections are given for rewarding the skill and creativity and effort he put into creation of work from his intellectual knowledge and not mere discovery of any known substance that is already known or that is already existing in nature or that which constitutes traditional knowledge. Another issue is whom should the reward reach, whether it is the AI that must receive or the programmer behind him.

Granting of patent involves the fulfilment of three main conditions namely novelty, non-obviousness and industrial utility that are considered central to patent law. Non-obviousness, as one of the important aspect, is to grasped from what is not obvious to a person skilled in the art. Thus it is a standardized comparison that is made with a person skilled in art of the same profession. Now when we take the scenario of AI generated works, with whom should we compare the work with is another question that must be looked upon.

Here we can delve upon the questions of replacing person with whom the AI generated autonomous work to be compared with similar computer software or algorithms that are trained with data from a designated field of art. Is that plausible or the old tradition is to be followed?

A. LIABILITY ISSUES:

The IP law is intended to reward and incentivize the authors and owners of the expressed work and if any person without the authorization and license reproduces such works it amounts to what is called as Infringement.

With the advent of AI, one can easily perform infringing acts and can easily reproduce in large amounts such as plagiarism, etc. As there are benefits from the technologies in vogue, there are also consequent risks and threats that one must face.

Thus considering that AI can produce creative works from data fed into it and data learning techniques such as Machine Learning (ML), should such data feeding process or data utilization process by AI that is done without authorization be considered amounting to infringement.

Image 2 Fair Use under Copyright Law, Source: *Shutterstock*, Stock Illustration ID: 1862655610.

There is a concept known as *fair use* that acts as an exception to the acts of infringement.

Fair use is a doctrine in copyright law that permits limited use of copyrighted material without having to first acquire permission from the copyright holder. This doctrine is among the most significant in the field of Copyright law, as it distinguishes between a legitimate use of a work and a flagrant copying of a work. It is a legal doctrine, which allows a person to make limited use of copyrighted work without the permission of the owner.

There are four factors that are considered for determining fair use that consists of Purpose, Amount, Nature and Effect of such work that has been used by the individual

without any authorization. Thus fair use depends according to these and if all these factors point out to a fair use of copyrighted work it won't amount to infringement. Fair use under Copyright Act, 1957 is recognized under Section 52. These acts constitute personal use including research purposes, criticism or review, reporting of current events and many others that are included under the Act. There are issues present is this aspect as well. There is an open question on whether fair use provisions should be applicable to AI systems as well.

Coming to the aspect of designs under the IP regime, the above mentioned classification applies and there are AI assisted designs that can be kept par with computer aided designs that raises no problem at all while there are also autonomous generations of AI without human intervention at all raises the problems of granting protection. Whether skilled act is being involved is further aspect that needs to be beheld.

B. DATA PRIVACY ISSUES:

AI is fundamentally data dependent and with such much reservoir of data and to make the results and outputs of its works more accurate that calls the primary need of curated data increases, makes vast amount of data to be analyzed thus opening the risks of privacy as well as copyright infringement[5]. AI's hunger for data puts immense pressure on data privacy compliance. Since it can easily be replicated and similar works can be created without permissions, to cope up with these practices calls for a multi-prolonged strategy.

There occurs an importance to safeguard privacy and mitigation strategies that are to be implemented to prevent such hazards in the future. Mitigation strategies for data privacy encompasses a wide range of proactive services aimed at reducing data privacy and risks in which it includes data anonymization, encryption and consent based data access to safeguard privacy holds a significant position among others. Data anonymization and

[5] Iveta Petrova, *Data Privacy and AI: Securing Intellectual Property in the Modern Digital Landscape*, Evalueserve https://www.evalueserve.com/blog/data-privacy-and-ai-securing-intellectual-property-in-the-modern-digital-landscape/.

encryption safeguard privacy by removing identifiable information and securing sensitive data, while consent-based access empowers individuals and ensures transparency. Comprehensive data protection laws like India's Digital Personal Data Protection Act, 2023[6], aim to promote accountability and ethical data practices, essential for upholding privacy rights and fostering trust in digital environments. Compliance with such laws is crucial for responsible data stewardship and maintaining trust between organizations and stakeholders.

Recent project of Zurich University's center for IP and Competition Law and the Swiss IP institute offered recommendations stating AI should be recognized as inventors. It is conducting a research and policy project that explores the future of IP law in AI context and sets out various recommendations and further implementation[7].

Bearing in mind the above there exists urgent need of the hour to bring about plausible policy changes that must fit not only the present scenario but also to address the future contingencies of our developing world.

IX. EXISTING AI GENERATED INVENTIONS:

A. DABUS:

DABUS is a device that is invented for autonomous bootstrapping of unified sentience, and it is an AI tool that has developed by Dr. Stephen L. Thaler, the CEO of Imagination Engines in the United States. The DABUS came up with two inventions titled "food container and devices and methods for attracting enhanced attention – wo2020079499", "food container- ep3564144a1". Its two artificial neural networks that are capable of generating new ideas as well as checking the novel aspects of such generated new ideas.

This device has been rejected in UK, Europe and US because as under their IP regime AI cannot be granted protection since the absence of a legal personality that acts as a pre-

[6] Act No. 22 of 2023

[7] Peter Georg Picht & Florent Thouvenin, *AI&IP: Theory to Policy and Back Again Policy and Research Recommendations at the Intersection of Artificial Intelligence and Intellectual Property*, (2022).

condition and thus also cannot have a title. Due to these reasons the patent has been rejected in the said countries.

The South African Government granted patent on the basis of formalities alone and substantial aspects were not considered that lead to patenting the said invention. The Australian Government granted patent and identified AI as inventor and recapped that the said act was to promote inventions that are of great industrial utility and not to prohibit Patent Act.

B. NEXT REMBRANDNT:

It is a device that is capable of creating works that are analogous to celebrated AI artist.

The Next Rembrandt is a computer-generated 3-D–printed painting developed by a facial-recognition algorithm that scanned data from 346 known paintings by the Dutch painter in a process lasting 18 months and mimics the Dutch artist. The portrait consists of 148 million pixels and is based on 168,263 fragments from Rembrandt's works stored in a purpose-built database. The project was sponsored by the Dutch banking group ING, in collaboration with Microsoft, J. Walter Thompson marketing consultancy, and advisors from TU Delft, The Mauritshuis and the Rembrandt House Museum.

Image 3 The Next Rembrandt, Source: Microsoft, available at https://news.microsoft.com/wp-content/uploads/prod/sites/93/2016/04/next-rem5.jpg

C. Diversified Adversarial Learning + Learning Encrypted (DALL-E 2):

In 2021, AI system DALL-E 2 demonstrated an ability to autonomously create photorealistic images from text prompts.[8] It is an AI system where it has the capability of generating images from text prompts, i.e., it can create realistic images from description that we ask for even in a natural language followed.

D. RAGHAV and the stand taken by Indian Law[9] on AI:

In November 2020, the Indian Copyright Office, under the Indian Copyright Act, 1957, made history by becoming the first country to recognize an AI as a co-author. The ICO registered "RAGHAV" an AI Painting App as a co-author of the work "Suryast" which is the Robot's version of Vincent van Gogh's famous painting "Starry Night"[10]. This move by the ICO made happier many who support granting protection to AI generated works whilst raised issues among other non-supporters.

Speaking about the justification of such a decision, the Indian law on copyrights doesn't explicitly mentions the term author to include human alone. Thus, by keen analysis of the copyright law one can understand that due to absence of such explicit mentioning of humans alone, negating AI is not plausible thus bringing it into the scope for conferring AI authorship. Our Indian law, under the Indian Copyright Act, has thus recognized AI as a co-author and granted protection under the Copyright Act.[11] India has taken a right stance on this aspect ending certain notorious issues surrounding AI and is supported by many. Also, the Standing Committee's 161th report made IP their focal point of discussion and affirmed that the current copyright law is not equipped enough to protect AI generated works and suggested amendments focusing on similar issues. Other countries too can take this as a model basis on consideration of AI generated works and policy interventions.

E. WIPO Conservation on IP and AI in September 2019:

[8] *Ai And Intellectual Property Rights: Issues And Impacts*, IIPRD.
[9] THE COPYRIGHT ACT, 1957. ACT NO. 14 OF 1957
[10] Sreelakshmi B, *RECOGNITION OF AI CO-AUTHOR RAGHAV- AN ANOMALY?* Center for Study and Research in Intellectual Property Rights [CSRIPR].
[11] THE COPYRIGHT ACT, 1957. ACT NO. 14 OF 1957

The WIPO conservation held on two sessions, mainly exemplified the questions surrounding the protection of AI generated works. It discussed about various issues involved with AI including granting of legal personality to AI, creation of sui generis protection for AI created work and the second session focused on the aspects of authorship and ownership. Despite all these efforts, nations are still struggling to come to a uniform approach in granting protection to AI autonomous generated works.

X. CONCLUSION AND WAY FORWARD:

AI in this current scenario plays a very vital role in everyday life and helps in the development of technologies significantly. One cannot avoid the extensive use of AI that makes work easy and much easier in the future thus calling for a policy revision immediately and as an urgent need of the hour. For that reason, AI generated works must be recognized by all countries and promotion of original creations must be recognized and the law must not be restricted to human inventions alone. Internationally agreed level of protection must be accorded.

Under the Indian Law, definitions under Copyright law under Section 2(d) should be amended in such a way that AI is also given inclusion under the definition of Author. If such AI is to be regarded as a joint author, the term of protection will be an issue that can be avoided by amending the provision to begin such term of protection after the date of creation of the work thus neutralizing the fact that AI is immoral unlike a human. Morality rights and related issues can be avoided by restricting them to AI generated works since these rights are exclusively based on personality. Also registration must be made mandatory in these cases.

WIPO can consider formulating an international framework recognizing AI as inventors for patent filing under certain conditions and international collaboration and standards becomes a pressing necessity at present so as to bring about global level policy changes that shall clarify the status and ownership of AI and its protection and rights under the global IP regime. Therefore, policy revisions and amendments in current law are thus imperative so as to prevent future contingencies.

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